

WHAT IS CLAIMED IS:

- 1           1.     A data channel, comprising:  
2               a digital-to-analog converter (DAC) circuit including a variable gain amplifier  
3               (VGA), the DAC circuit providing digital outputs at an analog-to-digital converter (ADC)  
4               in response to read signal analog inputs and DAC digital inputs; and  
5               a controller, coupled to the DAC circuit, for determining read head channel  
6               amplitude based upon programming of the DAC, code received from the ADC and gain  
7               code obtained from the VGA.
- 1           2.     The data channel of claim 1, wherein the code from the ADC is a code  
2               detect signal.
- 1           3.     The data channel of claim 1, wherein the code from the ADC is a trip  
2               code.
- 1           4.     The data channel of claim 1, wherein the code from the ADC is at least  
2               one digital output of the ADC.
- 1           5.     The data channel of claim 1, wherein the DAC circuit further comprises an  
2               analog processing device for providing a predetermined output signal to the VGA in  
3               response to a DAC input.

1           6.       The data channel of claim 5, wherein the analog processing device  
2 comprises an analog switch for providing a selection between input signals.

1           7.       The data channel of claim 6, wherein the selection between input signals  
2 provides an output signal having predetermined high and low amplitudes.

1           8.       The data channel of claim 5, wherein the controller causes the DAC to  
2 provide low and high codes to the analog processing circuit, wherein the VGA applies  
3 gain on both of the signals from the analog processing circuit resulting from the high and  
4 low codes from the DAC, the VGA applying gain until the output of the ADC reaches a  
5 level determined by a predetermined trip code.

1           9.       The data channel of claim 1, wherein head amplitude characterization is  
2 performed once with data filtering and again with the servo filtering to generate both data  
3 VGA gain values and servo VGA gain values, the data VGA gain values and servo VGA  
4 gain values being used to determine the input amplitude of the data channel.

1           10.     An analog front end for a read channel, comprising:  
2           an analog processing circuit for receiving read signals;  
3           a digital-to-analog converter (DAC), coupled to the analog processing circuit for  
4     providing high and low control signals to the analog processing circuit for producing  
5     predetermined analog processing circuit output signals;  
6           a variable gain amplifier (VGA), coupled to the analog processing circuit, for  
7     processing the predetermined analog processing circuit output signals using VGA gain  
8     codes for producing amplified signals;  
9           an analog-to-digital converter (ADC), coupled to the VGA, for producing an  
10    ADC code spread in response to the amplified signals;  
11          memory for storing an amplitude of two input signals, the ADC code spread  
12    associated with the two input signals and two VGA gain codes associated with the two  
13    input signals and corresponding high and low DAC control signals; and  
14          a processor, coupled to the memory, for calculating an amplitude of any input  
15    signal using an equation derived from the amplitude of the two input signals, the ADC  
16    code spread associated with the two input signals and the two VGA gain codes associated  
17    with the two input signals and corresponding high and low DAC control signals.

1           11.     The analog front end of claim 10, wherein the analog processing device  
2     comprises an analog switch for providing a selection between input signals.

1           12.     The analog front end of claim 11, wherein the DAC and analog processing  
2     device provides two output signals having predetermined high and low amplitudes.

1           13.     The analog front end of claim 10, wherein the processor derives the  
2     equation using both data filtering and servo filtering for providing both data VGA gain  
3     values and servo VGA gain values.

1           14.     A magnetic storage device, comprising:  
2             a magnetic storage medium for recording data thereon;  
3             a motor for moving the magnetic storage medium;  
4             a head for reading and writing data on the magnetic storage medium;  
5             an actuator for positioning the head relative to the magnetic storage medium; and  
6             a data channel for processing encoded signals from the magnetic storage medium,  
7     the data channel comprising  
8             a digital-to-analog converter (DAC) circuit including a variable gain  
9     amplifier (VGA), the DAC circuit providing digital outputs at an analog-to-digital  
10    converter (ADC) in response to read signal analog inputs and DAC digital inputs; and  
11             a controller, coupled to the DAC circuit, for determining read head  
12    channel amplitude based upon programming of the DAC, code received from the ADC  
13    and gain code obtained from the VGA.

1           15.     The magnetic storage device of claim 14, wherein the code from the ADC  
2     is a code detect signal.

1           16.    The magnetic storage device of claim 14, wherein the code from the ADC  
2    is a trip code.

1           17.    The magnetic storage device of claim 14, wherein the code from the ADC  
2    is at least one digital output of the ADC.

1           18.    The magnetic storage device of claim 14, wherein the DAC circuit further  
2    comprises an analog processing device for providing a predetermined output signal to the  
3    VGA in response to a DAC input.

1           19.    The magnetic storage device of claim 18, wherein the analog processing  
2    device comprises an analog switch for providing a selection between input signals.

1           20.    The magnetic storage device of claim 19, wherein the selection between  
2    input signals provides allows an output signal having predetermined high and low  
3    amplitudes.

1           21.    The magnetic storage device of claim 18, wherein the controller causes the  
2    DAC to provide low and high codes to the analog processing circuit, wherein the VGA  
3    applies gain on both of the signals from the analog processing circuit resulting from the  
4    high and low codes from the DAC, the VGA applying gain until the output of the ADC  
5    reaches a level determined by a predetermined trip code.

1           22.     The magnetic storage device of claim 14, wherein head amplitude  
2     characterization is performed once with data filtering and again with the servo filtering to  
3     generate both data VGA gain values and servo VGA gain values, the data VGA gain  
4     values and servo VGA gain values being used to determine the input amplitude of the  
5     data channel.

1           23.     A data channel, comprising:  
2             means for providing input signals;  
3             means, coupled to the means for providing input signals, for providing controls  
4     signals to the means for providing input signals;  
5             means, coupled to the means for providing input signals, for amplifying signals  
6     from the means for providing input signals;  
7             means, coupled to the means for providing control signals, for providing digital  
8     outputs in response to signals from the means for amplifying and to the control signals;  
9     and  
10            means, coupled to the means for providing digital outputs, for determining a read  
11     head channel amplitude based upon programming of the means for providing controls  
12     signals, code provided to the means for providing input signals, and gain code obtained  
13     from the means for amplifying the input signals.

1           24.     A magnetic storage device, comprising:  
2           means for recording data thereon;  
3           means for moving the means for recording data;  
4           means for reading and writing data on the means for recording data;  
5           means for positioning the means for reading and writing relative to the means for  
6     recording data; and  
7           means for processing encoded signals from the means for recording, the means  
8     for processing encoded signals comprising  
9                 means for providing input signals;  
10                means, coupled to the means for providing input signals, for providing  
11     controls signals to the means for providing input signals;  
12                means, coupled to the means for providing input signals, for amplifying  
13     signals from the means for providing input signals;  
14                means, coupled to the means for providing control signals, for providing  
15     digital outputs in response to signals from the means for amplifying and to the control  
16     signals; and  
17                means, coupled to the means for providing digital outputs, for determining  
18     a read head channel amplitude based upon programming of the means for providing  
19     controls signals, code provided to the means for providing input signals, and gain code  
20     obtained from the means for amplifying the input signals.